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EVALUATION OF SOUTHERN PINE BEETLE INFESTATIONS ON THE OCONEE NATIONAL FOREST, PIEDMONT NATIONAL WILDLIFE REFUGE, AND HITCHITI EXPERIMENTAL FOREST, GEORGIA

By
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INTRODUCTION

An aerial sketchmap survey was used to evaluate southern pine beetle infestations on two Ranger Districts of the Oconee National Forest, Piedmont National Wildlife Refuge, and Hitchiti Experimental Forest, Georgia. The surveys, which covered 299,236 acres, were performed by the Asheville Office of the Forest Resource Protection Unit to determine the current status and trend of southern pine beetle populations in these areas.

METHODS

Standard aerial sketchmap survey techniques were utilized on all areas.[1/] The sketchmap flights were 50 percent surveys on the Uncle Remus Ranger District, Piedmont National Wildlife Refuge, and Hitchiti Experimental Forest; and 100 percent on the Redlands Ranger District.

A portion of the spots detected during the aerial phases of the evaluation were examined on the ground to confirm the cause of tree mortality, to determine the percent of spots that were active, and to assess the general condition of the beetle population.

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis* Zimm.

1/ Detection of Forest Pests in the Southeast, 1970, USDA, USFS, SA, S&PF, Div. of FPM, Pub. S&PF-7, Atlanta, GA. 51 pp.

Hosts - The southern pine beetle will attack all species of southern yellow pine. However, loblolly pine, *Pinus taeda* L., and shortleaf pine, *P. echinata* Mill., are the preferred hosts.

Type of damage - Death of the tree is the result of cambial mining by the southern pine beetle as it constructs its gallery. The beetle also introduces the blue stain fungi, *Ceratocystis* spp., which slows down or blocks conduction of water in the stem.

Life cycle of the beetle - The beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark for pupation. The callow adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer and as many as seven generations may be produced in a year.

RESULTS AND DISCUSSION

Results of the evaluations showed a low level of infestation on the areas surveyed (Table 1). Infestations were found lightly scattered throughout the pine type. The major change in the current outbreak is spot size and number of spots. The spot infestations at the time of this survey were smaller and contained small numbers of active infested trees. Spot infestations ranged in size from one to 65 trees. The potential of the population present at the time of this survey indicates that the outbreak may continue at low levels in the summer of 1976. Figure 1 shows the areas of heaviest infestation.

We suggest that because of the sharp decline in southern pine beetle population levels on these areas, the most intensive suppression efforts be directed to more severely infested districts on Georgia's national forests. However, the opportunity to reduce the beetle population to an endemic level exists on these areas, and intensive surveillance and control should be continued for spots with continuing beetle activity and new spots.

RECOMMENDATIONS

Where timber resources can justify suppression measures, the districts should continue to follow guidelines outlined in the 5250 section of the Forest Service Manual which are as follows:

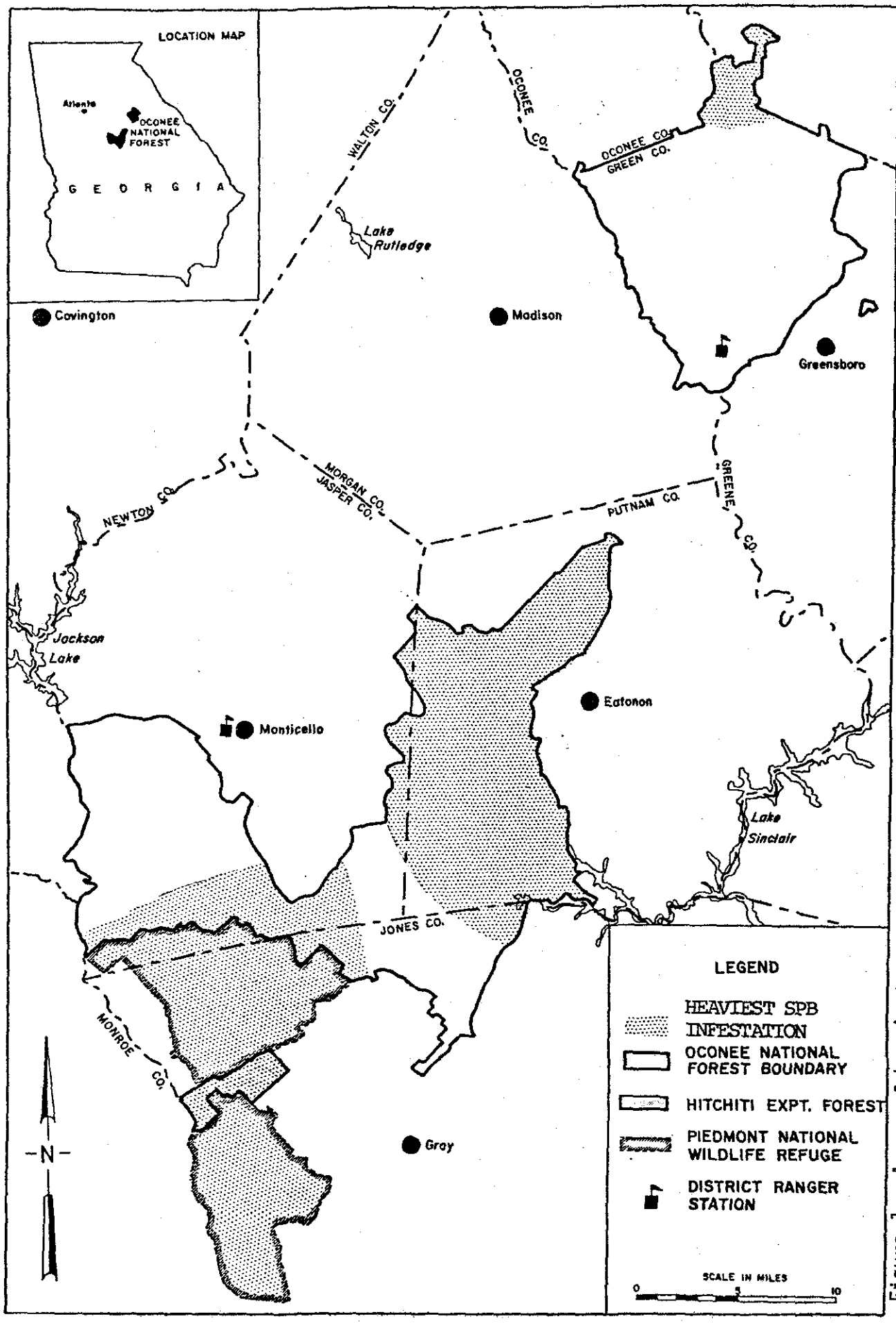

Figure 1. Areas of heaviest southern pine beetle infestation on the Oconee National Forest, Piedmont National Wildlife Refuge, and Hitchiti Experimental Forest, Georgia.

Table 1. Summary of southern pine beetle evaluations on the Redlands and Uncle Remus Districts, Oconee National Forest, Piedmont National Wildlife Refuge, and Hitchiti Experimental Forest, Georgia.

	OWNERSHIP UNIT			
	Redlands R.D.		Uncle Remus R.D., Piedmont N.W.R., Hitchiti Exp. For.	
	1974	1975	1974	1975
1. Results compiled from data collected during the aerial phase of the evaluation:				
Survey type	Sketchmap	Sketchmap	Sketchmap	Sketchmap
Date of aerial survey	9-10-74	7-29-75	9-10-74	7-28-75
Total acreage surveyed	85,462	85,462	213,774	213,774
Total susceptible host type (acres)	76,900	76,900	158,196	158,196
Total number of spots within the survey boundary	147	29	332	359
Spots per M acre of host type (trees)	1.9	.37	2.1	2.3
Average spot size (trees)	20	6	20	3
Range of spot sizes (trees)	1-100	1-40	1-100	1-65
2. Results compiled from data collected during the ground and aerial phases of the evaluation:				
Date of ground phase	10-2-74	7-29-75	10-2-74	8-8-75
Infested trees per M acre of host type	21	.34	29	2.14
Total number of infested trees within the survey boundary	1,644	26	4,608	339
Ratio of green infested to total red and fading trees	1:5	1:13	1:3.5	1:46
Total volume of infested trees (cu. ft.)	36,661	813.8	156,752	4,000

1. Removal of Infested Trees by Commercial Sale or Administrative Use. When infested trees of merchantable size are accessible, they should be removed by commercial sale or administrative use procedures. Logging of the infested material should begin immediately. Contract time limits should insure rapid removal.

   Where practical, and if host type is present, a 40- to 70-foot buffer strip should be marked and cut adjacent to and ahead of the most recently infested trees. This practice is effective in reducing the possibility of "breakouts." When only a small volume of infested merchantable material occurs in a spot, non-infested trees surrounding the spot may be marked to provide an operable cut.

   The order of priority for removing beetle infested timber from a spot should be as follows:

   Trees having nearly developed broods (usually the red and fading trees).

   Trees having young broods (usually the green, recently infested trees).

   Trees in the buffer zone.

2. Piling and Burning. Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly burning the bark of infested trees. The entire bark surface must be thoroughly burned to insure effective control. The order of priority for cutting, piling, and burning infested trees, particularly the large spots, is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the piling and burning operation.

3. Chemical Control. Chemical formulation recommended for southern pine beetle control is a 1/2 percent lindane spray with No. 2 fuel oil as the carrier. This may be formulated from a 20 percent lindane emulsifiable concentrate or oil concentrate at the rate of 11 pints of concentrate in enough fuel oil to make 55 gallons of spray. (Ratio of one part 20 percent lindane EC to 39 parts No. 2 diesel fuel).

   Cut, limb, and buck all infested trees into workable lengths. Spray the infested bark surface to the point of run-off. A compressed air sprayer (3-gallon capacity or equivalent) is an ideal applicator. Infested logs must be turned two or three times to insure complete treatment of infested bark. Spray stumps and bark removed by woodpeckers. Low pressure sprayers may be used to treat large, accessible infestations.

The order of priority for cutting and spraying infested trees in large spots is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the chemical control operation.

Never spray trees from which southern pine beetle brood has emerged. Natural enemies of the southern pine beetle in these trees can then complete their development. To prevent aerial spotters from mapping treated spots, cut trees with red needles from which beetles have emerged.

Instructions for minimizing the adverse effects of mixing, transporting and storing pesticides, applying pesticides and disposing of pesticide containers and excess chemicals are outlined in section 8.3 of the Forest Service Health and Safety Code and FSM 5242.21. Detailed safety procedures should be outlined in the project suppression plan.

4. Reexamination of Treated Areas. Reexamine areas where infested trees were removed by commercial sales, piled and burned, or chemically treated within two or three weeks after treatment to check for additional infested trees. If additional trees are found, treat them.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key--out of the reach of children and animals--away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds,

streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U. S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.